Lost Lives: Lessons to Be Learned
Work-related deaths in British Columbia in 2002
Death on the water
Rescue attempt ends with three men dead
B.C. loggers' death injury rate double that of other industries
Overcome by fumes

Photo on dedication page

The photo on the back of the title page shows the Workers' Memorial in the Sanctuary at Vancouver's Hastings Park. The memorial was dedicated on the Day of Mourning in April 2001.

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About the WCB

Preventing on-the-job injury and disease is the first priority of the Workers' Compensation Board (WCB) of British Columbia. WCB officers inspect worksites in B.C. to make sure they comply with the Occupational Health and Safety Regulation, which sets out minimum workplace standards for health and safety. The WCB also investigates serious workplace accidents and consults with employers, supervisors, and workers to promote health and safety in the workplace.

Under the requirements of the Workers Compensation Act, a worker must report an injury or a disabling occupational disease as soon as possible to the employer. The employer must report work-related injuries, occupational diseases, and work-related deaths to the WCB within three days. A worker may not make an agreement with the employer to give up WCB benefits.

If a worker suffers a work-related injury or illness, the WCB provides fair compensation that may include medical costs, loss of earnings, physical rehabilitation, and pensions. The WCB also works with employers to help injured workers return to work. If a worker is killed on the job, counselling and financial help are made available to the victim's family. For more information on requirements or eligibility for WCB coverage, contact the WCB office nearest you.

WCB Prevention Information Line

105-04862/

The WCB Prevention Information Line can answer your questions about workplace health and safety, worker and employer responsibilities, and reporting a workplace accident or incident. The Prevention Information Line accepts anonymous calls.

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Lost Lives: Lessons to Be Learned

Work-related deaths in British Columbia in 2002

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Dedication

In memory of those who have lost their lives as a result of a workplace accident or occupational disease.

Tragedies that can lead to change

Some workplace accidents that result in the death of workers have a high profile, capturing the attention of the media and the public.

In 2002 and early 2003, several such work-related accidents focused the public's attention. They all resulted in more than one death:

- In August 2002, the *Cap Rouge II* fishing boat capsized near the mouth of the Fraser River. There were seven people on board. Five people lost their lives, including two children.
- In November 2002, two men died at a winery near Oliver, in the Okanagan Valley. One of them, the owner of the winery, collapsed when taking a sample from a large tank of fermenting wine. The second man entered the tank to try to rescue him. The owner and the would-be rescuer both died.
- In January 2003, a worker entered a compartment of the hull of a barge moored on the Fraser River at New Westminster. The worker did not return to the deck. Four other workers entered the flotation compartment to attempt rescue. The first worker and three of the four would-be rescuers died.

In 2002, the Workers' Compensation Board of British Columbia accepted claims for 158 deaths from work-related accidents and diseases. Since most work-related deaths could have been prevented, the loss of these lives is especially tragic.

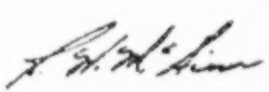
The *Cap Rouge II* accident brought home to the public the importance of safety in an industry that can be extremely hazardous. Fishing crews are challenged by the perils of working on cold, unforgiving seas.

The winery and barge accidents showed the hazards of working in what are called confined spaces, which may contain unsafe or toxic air, or air that does not contain enough oxygen to sustain life. These two accidents remind us that confined spaces come in many shapes and forms, and the dangers that accompany them are present in many workplaces in B.C.

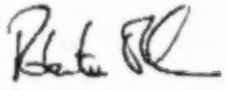
This year the first part of our *Lost Lives* report includes a special review of work-related deaths in the fishing industry and in confined spaces, and it includes "lessons to be learned" from such incidents.

Many other accidents, however, occur away from the public eye. This is especially true, for example, in forestry, with operations often located in remote places. The second part of this report reviews all work-related deaths in 2002 in B.C.

There are lessons to be learned from almost every work-related death. All of us need to heed these lessons to prevent similar tragic events from happening again.



Ralph McGinn
President and CEO
Workers' Compensation Board
of British Columbia



Roberta Ellis,
Vice President, Prevention Division
Workers' Compensation Board
of British Columbia

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Lessons to be learned from fishing and confined space accidents

Death on the water
Rescue attempt ends with three men dead
B.C. loggers' death, injury rate double that of other industries
Overcome by fumes

Deaths in the fishing industry

On Aug. 13, 2002, a commercial fishing vessel called the *Cap Rouge II* overturned about eight kilometres offshore, near the mouth of the Fraser River, in an area known for its rough waters.

The *Cap Rouge II* incident knitted together B.C.'s extended fishing community, and British Columbians generally, in grief for the lives lost in this terrible accident. It also starkly reminded all of us of the dangers commercial fishing crews face in making a living on the sea.

Commercial fishing can be one of B.C.'s most hazardous industries. Fish harvesters often work with fast-moving lines under extreme tension (some laden with hooks or other gear), they work on slippery surfaces, and they sometimes get caught in stormy weather. Frigid water, with rescuers often many hours away, adds to the dangers of an accident at sea.

Accidents are not inevitable. There is much that can be done to prevent them and to reduce the possibility of death in an emergency.

This section on the fishing industry looks at the cause of deaths in recent years in this industry (86% from drowning). It also provides vital safety messages to workers in the fishing industry:

- Cold water can kill within a few minutes, so keep out of the water if possible.
- Wear a personal flotation device (PFD) when working on deck where there is a danger of falling overboard or in heavy weather.
- Practise emergency drills before you need them. Emergencies often happen in rough seas, in an unstable vessel, or in darkness. Crew members should have enough practice that they can perform emergency procedures in those conditions.

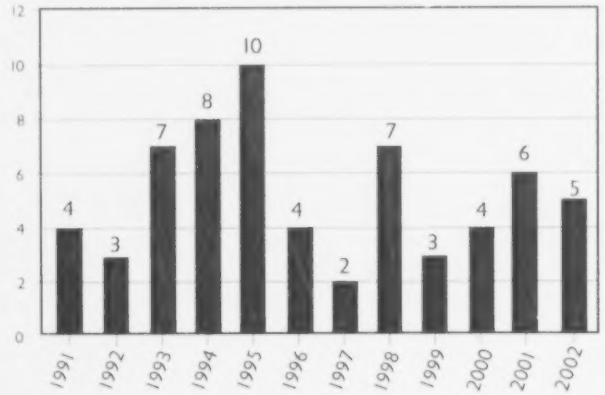
Cause of deaths in the fishing industry

Fishing is a $350 million industry in B.C. It is a major source of livelihood, especially in coastal communities. There are more than 8,500 workers licensed to harvest fish commercially, using methods such as trap fishing, trolling, gillnetting, longlining, seining, trawling, and dive fishing. Workers in the industry are also involved in fish packing and fish farming. Because most work is done on or near water, the greatest hazards are those that can lead to drowning.

The Workers' Compensation Board accepted claims for five deaths in the fishing industry in 2002. Three workers on the *Cap Rouge II* drowned when their boat capsized (the two children were not workers and not covered for workers' compensation). In another fishing accident, the boat sank and a deckhand drowned. The fifth fish harvester died when a poor exhaust system coupled with wind to the stern of the vessel forced engine combustion gases into the boat.

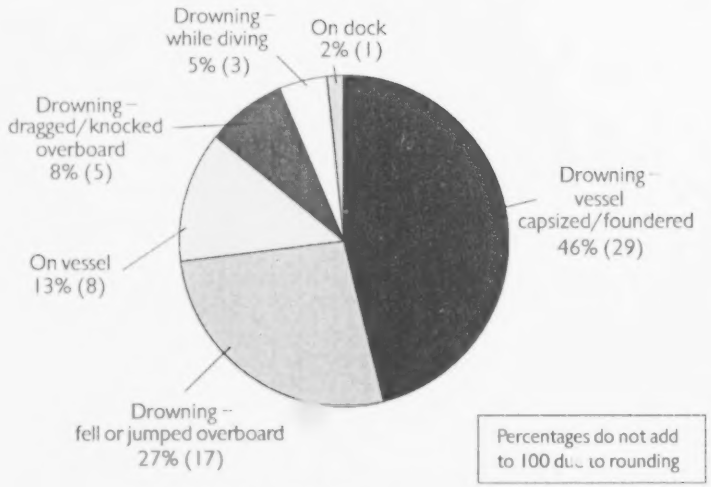
From 1991 to 2002, there were 63 deaths in the fishing industry. These numbers reflect the reality that *fish harvesting is one of the most hazardous industries in the province.* The potential for fatal accidents is clearly seen when we compare the number of fatalities with the number of injuries in different industries. In 2001, one worker died for every 26 WCB injury claims in the fishing industry. This ratio of 1:26 compares with ratios of 1:57 in the oil and gas industry, 1:83 in forestry, and 1:213 in construction.

Number of death claims accepted in fishing, 1991–2002



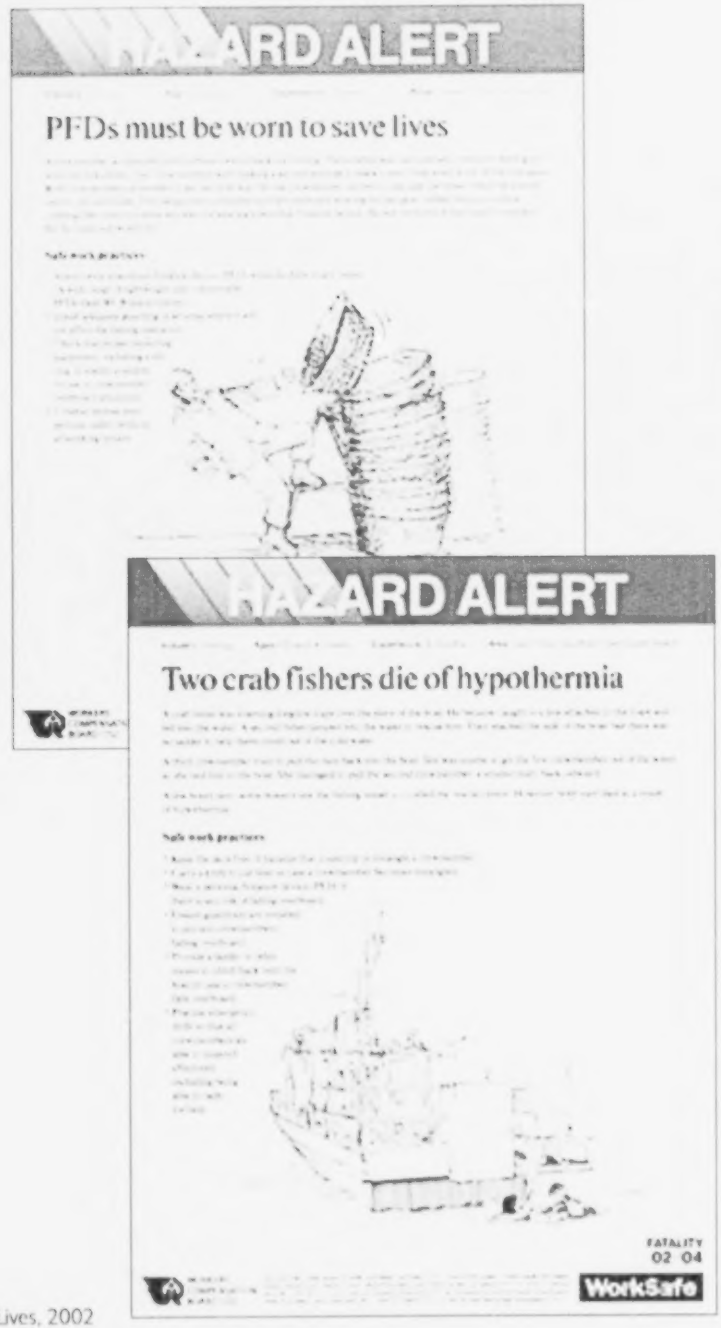
Over the 12 years from 1991 to 2002, the number of deaths in the fishing industry was 63. The average was 5.3 deaths per year, ranging from a low of 2 in 1997 to a high of 10 in 1995.

Types of incident, 1991–2002


Drowning – while diving 5% (3)
On dock 2% (1)
Drowning – dragged/knocked overboard 8% (5)
Drowning – vessel capsized/foundered 46% (29)
On vessel 13% (8)
Drowning – fell or jumped overboard 27% (17)
Percentages do not add to 100 due to rounding

Over the past 12 years, 54 of the 63 deaths (86%) were due to drowning. Over half (29) of these drowning deaths occurred when a fishing vessel capsized or foundered, as was the case with the Cap Rouge II in 2002. The rest resulted from vessels sinking, from crew members falling or being knocked or dragged overboard, and from diving accidents.

Death on the water



The drowning deaths in the fishing industry in 2002 highlight an important message communicated by a number of WCB hazard alerts in recent years: most drowning deaths result from the effects of immersion in the cold waters off the British Columbia coast. There are four stages in cold water immersion, and a person can die at any stage:

1. Initial immersion, or cold shock, which can cause a massive increase in heart rate and blood pressure and difficulty breathing. Drowning can occur in a few minutes. These reactions can quickly lead to panic, leaving the person unable to assist in their own rescue.
2. Short-term immersion, or swimming failure, characterized by an initial loss of body heat, shutdown of the extremities, and loss of coordination. Drowning can occur in 3 to 30 minutes.
3. Long-term immersion, or hypothermia, characterized by cooling of the body core and semi-consciousness, leading to drowning or heart failure.
4. Collapse after being rescued from the water, characterized by an excessive drop in blood pressure. Stage 4 can lead to brain or heart failure.

Cold water can kill, so the first rule of survival is to keep out of the water!

Accident investigations in the fishing industry have shown that most drowning deaths can be prevented by taking the following measures:

- If you need to abandon ship, go directly into the life raft, not the water.
- Wear an immersion suit or personal flotation device (PFD).
- If in the water, keep as much of the body afloat as possible.
- Make sure you have a ladder or other means of getting back on board as soon as possible.

WCB hazard alerts for fatal fishing accidents in previous years

In particular, masters and crews must conduct regular emergency drills so that everyone knows what to do and can respond effectively to emergencies – putting out a fire, abandoning ship, recovering someone from the water, or calling for help. Crew members who don't know what to do and how to do it add to the emergency.

The WCB thoroughly investigates workplace accidents involving deaths and critical injuries. The lessons learned from these accident investigations find their way into hazard alerts, safety bulletins, workshops, and other WCB initiatives.

Lessons to be learned

Many people in the fishing industry are committed to health and safety. They know that there are lessons to be learned from every work-related death. The industry is working to make sure that every owner, master, and crew member learns from the past so that the same accidents don't happen again and again.

Bruce Logan, safety director for the United Fishermen and Allied Workers' Union–CAW, has seen his share of tragedy on the water as well as the pain, suffering, and grief that results from the loss of fellow industry workers. He vividly remembers the first fatality he saw 25 years ago. A crew member was tying a beach-line to a tree stump on the shore. The line wasn't fastened properly and it whipped back, striking and killing the worker with its metal end.

"Experiences like that are devastating, and they are far too common among workers in our industry," he says. "That first fatal accident was a shock, but it was also a stark wake-up call. I learned that complacency coupled with a lack of knowledge could be a deadly combination on the job." To prevent this sort of incident, the union offers a workshop on beach-line safety before the salmon season. The WCB and the Coast Guard make presentations at this annual workshop.

Logan goes on to say, "While fishing *is* an inherently hazardous occupation, workers have to stop believing that 'things just happen.' Otherwise, things *will* just happen. They must begin to take *personal* responsibility for safety – and not just for their own safety, but also the safety of their co-workers. No amount of legislation, regulation, or education will entirely solve the problem if the worker doesn't internalize the issue. It has to come from within."

Michelle James, president of the B.C. Seafood Alliance, says that regulators, unions, and industry associations all have a part to play in reducing the high rate of fatalities in the fishing industry. However, at the end of the day, it is up to each vessel owner, master, and crew to make sure that everyone gets home safely.

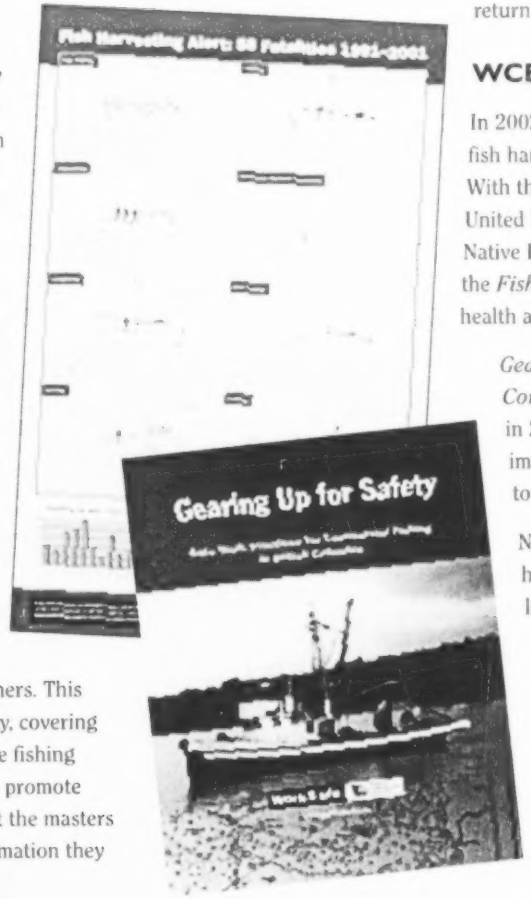
"We make every effort to communicate safety information, issues, and experiences to the industry, but both masters and workers have a role to play in implementing change," says James. "Vessel masters are responsible for safety aboard their vessels and they have to take this very seriously."

Campaigns for change

Efforts to reduce the number of fatalities and improve safety in the fishing industry are being made on several fronts.

Education and training

- WCB Prevention officers give educational presentations to masters and crews. A one-day workshop on emergency drills has been given many times since 1998. A new presentation on cold water immersion was added in 2002 and looks at why so many drowning deaths occur within a few minutes of falling overboard in the cold waters off the B.C. coast.
- The B.C. Council of Professional Fish Harvesters has developed courses for new crew working on fishing vessels and a course on marine emergency duties specifically for fish harvesters. These courses will help them work toward certification.
- The WCB is part of a multi-agency group that includes the Transportation Safety Board, Transport Canada, the Coast Guard, the Department of Fisheries and Oceans, the Council of Professional Fish Harvesters, the B.C. Seafood Alliance, and others. This group gives presentations on health and safety, covering requirements of all regulatory agencies for the fishing industry. The group is also looking at ways to promote health and safety information and ensure that the masters and crews on fishing vessels receive the information they need.



Organizational development

- The B.C. Seafood Alliance has hired a fishing industry safety coordinator using funds from WCB fishing assessments, with the agreement of employers in the industry. The coordinator is working to reduce serious injuries and fatalities and to help injured workers make a safe return to work more quickly.

WCB resources

In 2002, the WCB launched a poster campaign to remind fish harvesters of the critical importance of working safely. With the co-operation of the B.C. Seafood Alliance, the United Fishermen and Allied Workers' Union–CAW, the Native Brotherhood of B.C., and private fishing companies, the *Fish Harvesting Alert* poster is meant to become part of health and safety talks on all fishing vessels in the province.

Gearing Up for Safety: Safe Work Practices for Commercial Fishing in British Columbia was updated in 2002 and includes new information on cold water immersion and statistics on fishing fatalities according to the specific types of gear used.

Note: These resources are available online: http://www.healthandsafetycentre.org/s/lostlives.asp

Deaths in confined spaces

On November 10, 2002, when two experienced Okanagan wine-makers died in a devastating accident in a fermentation tank in a winery located near Oliver, the local community and the B.C. wine-making industry were shocked. One of the wine-makers, the owner of the winery, collapsed when taking a sample from a large tank of fermenting wine. The second man entered the tank to try to rescue him. Both men died of asphyxiation in the tank.

Just two months later, on January 10, 2003, the Lower Mainland was rocked by the news of a terrible accident at a barge docked at a shipyard along the Fraser River in New Westminster. A worker entered a flotation compartment of the barge hull and didn't return. Four other workers then entered the compartment to attempt rescue and were overcome. The first worker died, as well as three of the other workers. One firefighter attempting rescue was injured.

Both the winery tank and the compartment of the barge hull are considered confined spaces, which can have hazardous atmospheres and usually have only small openings for entering and exiting the area.

Other fatal accidents in recent years highlight the dangers of working in confined spaces:

- In 2001, a welder entered a compartment of a barge hull and became unconscious in the oxygen-deficient atmosphere. Four other workers entered the compartment to rescue the welder and also became unconscious. The welder died, but fortunately the other workers recovered from their injuries.
- In 1997, a worker entered a process vessel at a pulp mill. Nitrogen gas had leaked into the vessel, and the worker collapsed from oxygen deficiency. A second worker, who had been watching outside the entrance hole, also collapsed. The workers could not be revived.

These events show that confined space accidents may be rare, but they can be deadly. Would-be rescuers are often injured or killed. Accidents in confined spaces can be prevented.

This section reviews what a confined space is, what the key hazards are, and how to prevent accidents in confined spaces.

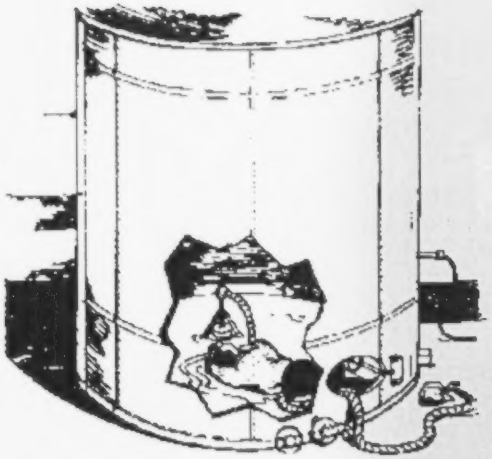
Key safety steps include:

- Identify all confined spaces that workers may encounter as part of their work.
- Before entering a confined space, test the air, ventilate or purge if necessary, and then retest.
- Before any worker enters a confined space, ensure that rescue procedures and equipment are in place and that rescuers are properly trained.

Rescue attempt ends with three men dead

Types of confined spaces

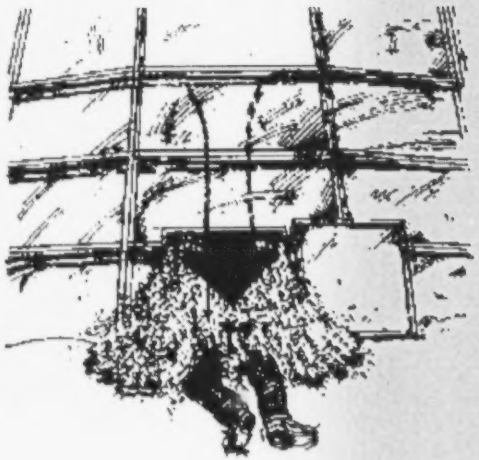
A confined space is an enclosed or partially enclosed area that is not designed or intended for continuous human occupancy. Although a confined space is large enough for a worker to enter to perform assigned tasks such as cleaning, maintenance, or repair, the small opening used for entry can make escape difficult and can complicate evacuation or rescue procedures. Confined spaces are found in tanks, silos, storage bins, process vessels, pipelines, sewers, double hulls, underground utility vaults, pits, and vats.



Confined spaces are especially dangerous because of the hazardous atmospheres that may be present. Flammable gases or vapours can ignite, causing an explosion or fire. Workers can be overcome by toxic gases such as hydrogen sulphide, methane, sulphur dioxide, and carbon monoxide. Inert gases such as nitrogen can displace oxygen, making the confined space oxygen-deficient. Lack of oxygen can cause a worker to lose consciousness almost at once and die of asphyxiation in as little as four minutes. Oxygen deficiency can also cause brain damage or heart failure.

Confined spaces such as silos and storage bins that contain loose materials pose a different danger. Workers can be engulfed in materials such as grain, sand, or gravel.

The table on page 11 gives examples of confined spaces and some of their hazards.



Confined spaces in various industries

Examples of confined spaces	Industry examples	Possible hazard
Ballast tanks	Marine vessels (e.g., ferries, barges, fish boats)	Oxygen deficiency
Boilers	General industry	Oxygen deficiency
Double hulls	Marine vessels, barges	Oxygen deficiency
Pumping stations	Municipalities, general industries	Toxic atmosphere, oxygen deficiency
Septic tanks	Municipalities, agriculture	Toxic atmosphere, oxygen deficiency
Vats	General industry, batch plants, agriculture	Toxic atmosphere, oxygen deficiency
Manure pits	Agriculture	Toxic atmosphere, oxygen deficiency
Silos, storage bins	Agriculture	Engulfment, oxygen deficiency
Pipelines, sewer lines	Construction, municipalities	Toxic atmosphere, oxygen deficiency
Utility vaults	Construction, municipalities, general industry	Oxygen deficiency
Grape presses and crushers	Food and beverage	Mechanical hazards, toxic atmosphere
Pits, sumps, and tanks containing waste water and materials	Food and beverage, municipalities, hospitals, large hotels	Toxic atmosphere, oxygen deficiency
Wine storage and fermentation tanks	Food and beverage	Oxygen deficiency, toxic atmosphere
Reaction vessels	Manufacturing	Toxic atmosphere, flammable atmosphere, oxygen deficiency
Storage tanks	General industry, manufacturing	Toxic atmosphere, flammable atmosphere, oxygen deficiency
Fuel tanks	Transportation, forestry, general industry	Toxic atmosphere, flammable atmosphere, oxygen deficiency
Tank cars, tank trucks	Transportation	Toxic atmosphere, flammable atmosphere, oxygen deficiency
Kilns	Community colleges, ore processing	Toxic atmosphere, oxygen deficiency

All confined spaces must be clearly identified so that workers know what they are getting into and can take precautions. This is necessary because confined spaces can be deceptive. They may appear to be harmless because dangerous atmospheres are invisible and often impossible to detect by smell. Thus, proper air testing must be done before workers enter a confined space. If the air is not safe to breathe, the space must be ventilated or purged and the air retested. *Experience has shown that almost all confined space fatalities could have been prevented if proper air testing and ventilation had been done prior to entry.*

Studies have also shown that over 60% of confined space deaths occur among would-be rescuers. It is human nature to try to help someone who has collapsed, without necessarily considering the reason for the collapse. Even if aware of the hazard, would-be rescuers may try to hold their breath or may think – wrongly – that they can get in and out quickly, before being affected. In the accidents mentioned on page 9, would-be rescuers died or suffered injuries when they entered a confined space without taking the necessary precautions. It is essential that rescue procedures and equipment be in place *before* a worker enters a confined space and that rescuers be properly trained in their use.

While tragic, fatalities can provide the impetus for greater efforts to improve workplace safety. For example, after the incident in 2002 that saw two men die of asphyxiation in a winery tank, the WCB partnered with the B.C. Wine Institute (BCWI) to give a series of educational presentations on confined spaces for BCWI members. The lessons learned from this and other accident investigations will be communicated to workers and employers through hazard alerts, workshops, or other WCB programs.

ARD ALERT
Confined space
Explosion kills one and seriously injures another
ARD ALERT
Two workers die from lack of oxygen in confined space
WorkSafe

WCB hazard alerts for confined space accidents in previous years

Lessons to be learned

Those working in various industries agree that there are lessons to be learned from almost every work-related death in a confined space. If these lessons can be applied to all workplaces with confined spaces, it is possible to prevent similar events from happening again.

Confined space accidents are rare, but they may end with the deaths of several workers. To prevent such fatalities, we need greater worker awareness of the dangers associated with confined spaces, says Ken Jupe, national occupational health and safety officer with the Pulp, Paper and Woodworkers Union of Canada.

"Employers must do all they can to minimize risks, including providing better training for their workforce on how to deal with the hazards," says Jupe. "They have to take this very seriously, because when it comes to confined space, the margin for error is nil. Personally, I would like to see tougher regulations that require safety certification for all workers who work in or around confined space hazards."

Grant McMillan, president of the Council of Construction Associations, says that workers must learn not to attempt to rescue fallen co-workers themselves unless they are trained in rescue procedures for confined spaces. "It's not like in the movies – if you try to be a hero there's a good chance that you'll end up dead," he says.

It's a lesson that Dawn Antle, marketing manager at the B.C. Wine Institute, knows all too well. In November 2002, two men died in a confined space accident at a winery in Oliver, B.C. The second man died while he was attempting to rescue the first. "B.C.'s wine industry is a tight-knit community," says Antle. "When a tragedy like that occurs, it's felt by all workers and their families in the industry."

Bruce Johnson, general manager at the Farm and Ranch Safety and Health Association, says that well-developed, in-depth safety procedures are vital, but when an accident occurs, workers often panic and may not think back to their training. "It would help if there was a quick, point-form emergency-response reminder sheet posted on or near the hazard," he says. "That way, workers could quickly see what to do and who to call if something goes wrong."

Ways to increase awareness

Besides the educational presentations co-sponsored by the WCB and the B.C. Wine Institute in 2002, the WCB uses different approaches to increase awareness of confined space hazards and how to deal with them.

Working with industry

- BC Ferries needed to develop a comprehensive confined space program for the hundreds of confined spaces on their vessels, such as hulls and void spaces, where workers check for cracks and leaks and do necessary repairs. The WCB consulted extensively with BC Ferries to assist them in the development of their program.
- Municipal workers conduct hundreds of confined space entries every year. The WCB has provided educational resources and consultation on safe confined space entry at events such as the Municipal Safety Conference.

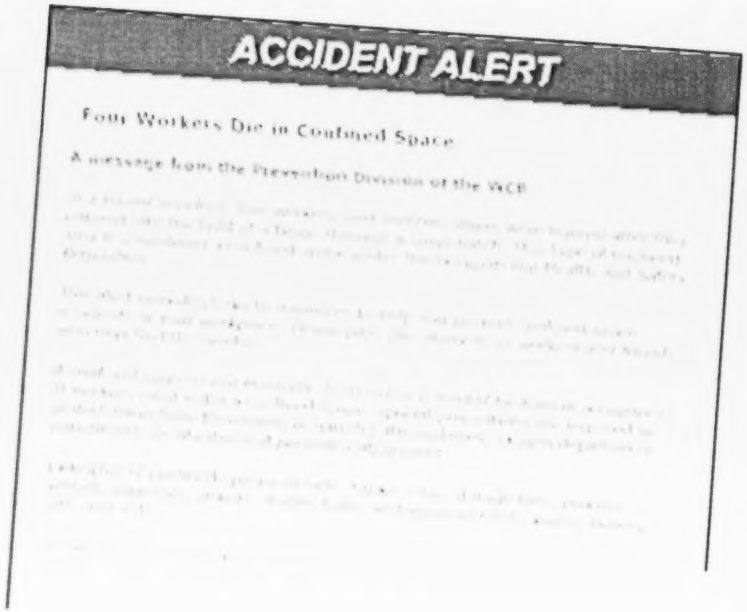
Program development

- The WCB's Prevention Division is developing awareness programs and strategies tailored to other industries where workers are at risk from confined space hazards. These programs will help workers understand the specific confined space hazards they may face, and how to control those hazards effectively.

WCB resources

- The WCB is updating its confined space entry manual to help employers implement a program for safe entry to confined spaces.
- To get information out as quickly as possible after the fatalities in 2002 and 2003, the WCB issued a confined space accident alert by e-news, outlining the hazards and listing resources.

Note: Resources such as the accident alert and hazard alerts are available online: http://www.healthandsafetycentre.org/s/lostlives.asp

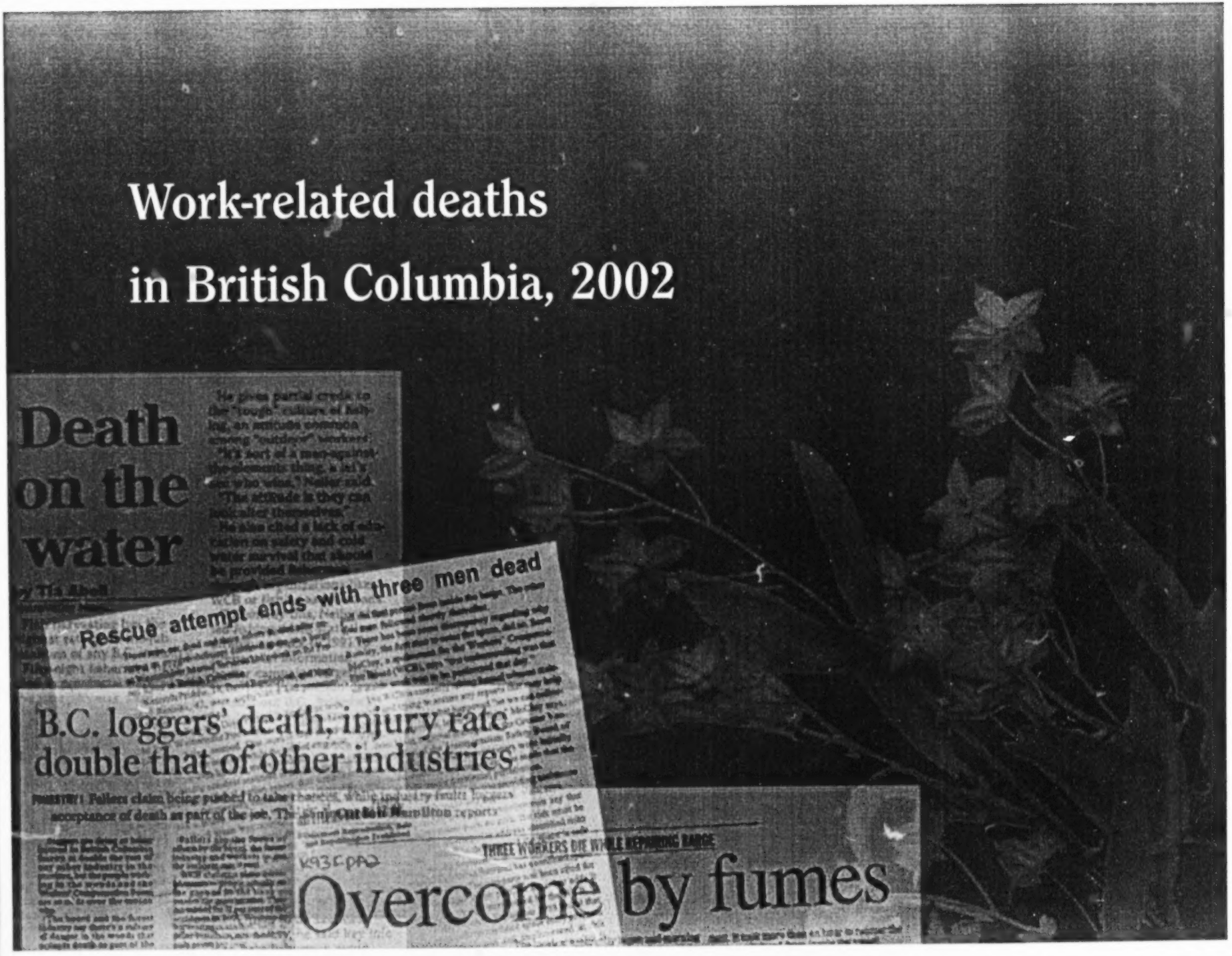

ACCIDENT ALERT

Four Workers Die in Confined Space

A message from the Prevention Division of the WCB

An accident alert on confined spaces was sent by e-mail to subscribers of WCB Prevention "e-news."

Work-related deaths in British Columbia, 2002


Death on the water
Rescue attempt ends with three men dead
B.C. loggers' death, injury rate double that of other industries
K93 PAD
THREE WORKERS DIE WHILE REPAIRING BARGE
Overcome by fumes

A review of work-related deaths in 2002

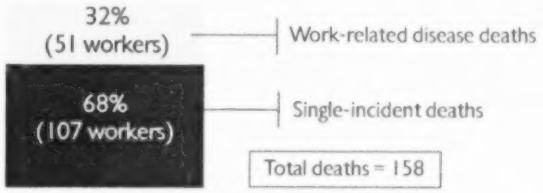
Work-related deaths can almost always be prevented. To learn from the lives that have been lost, employers, workers, and the WCB must combine efforts to improve health and safety in the workplace.

In 2002, the Workers' Compensation Board of British Columbia accepted claims for 158 work-related deaths. The death of each person – 150 men and 8 women – is a loss to their families, co-workers, and communities. This section provides a statistical overview of all work-related deaths in 2002.

Single-incident deaths are work-related fatalities that occur when workers receive injuries or are exposed to large amounts of hazardous substances. In these cases, workers die either immediately or soon afterwards. The recent fatalities in the fishing industry and in confined spaces were all single-incident deaths.

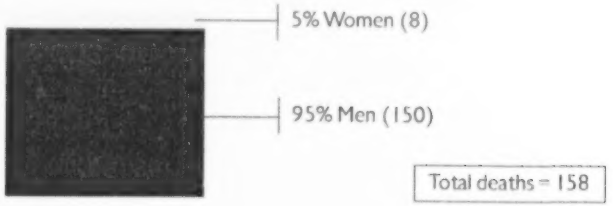
Work-related disease deaths are work-related fatalities that occur when workers contract a disease as a result of long-term exposure to a hazardous substance or contact with a disease-causing agent. In these cases, workers die after months or years have passed.

Single-incident and work-related disease deaths in B.C., 2002



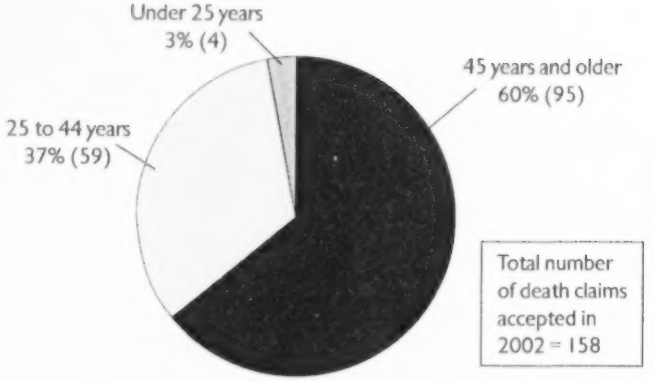
Single-incident deaths accounted for over two-thirds of the 158 work-related deaths in 2002.

Percentage of male and female workers who died as a result of work-related accidents and diseases in B.C., 2002



The disproportionate number of deaths of men (95%) reflects the fact that some of the higher-risk industries, such as transportation, construction, and forestry, still employ mostly male workers.

Work-related deaths by age group in B.C., 2002



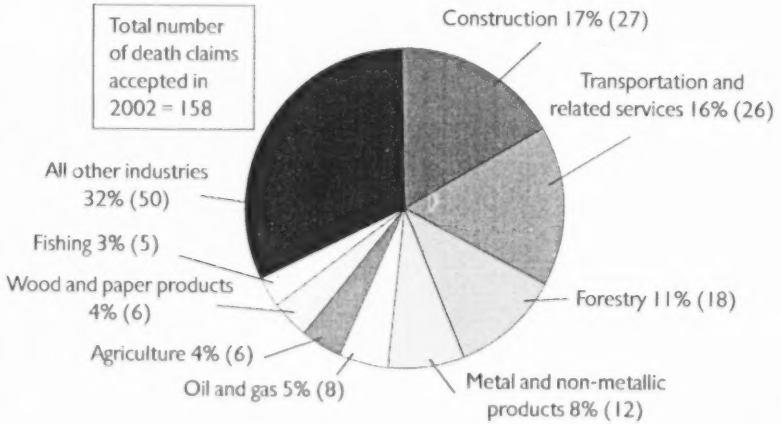
Sixty percent of workers who died in 2002 were 45 years or older.

In the pie graph on page 16, the average age at the time of death was 51 years, but this does not reveal the difference between work-related disease deaths and single-incident deaths. All 51 workers who died of work-related diseases were 45 years or older; in fact, 71% were in their 60s or 70s. For disease deaths, the average age was 68. For single-incident deaths, the average age was 43. The 25-year difference reflects the fact that certain work-related diseases, such as asbestosis and mesothelioma, usually develop decades after workers were exposed to the harmful substances that caused the diseases.

Every industry can be touched by death

When it comes to workplace injury and disease prevention, the WCB works with employers and workers across all industries because there is no such thing as a risk-free industry. Work-related deaths can occur in all industries in B.C.

Number of work-related deaths by industry in B.C., 2002


Total number of death claims accepted in 2002 = 158
Construction 17% (27)
Transportation and related services 16% (26)
Forestry 11% (18)
Metal and non-metallic products 8% (12)
Oil and gas 5% (8)
Agriculture 4% (6)
Wood and paper products 4% (6)
Fishing 3% (5)
All other industries 32% (50)

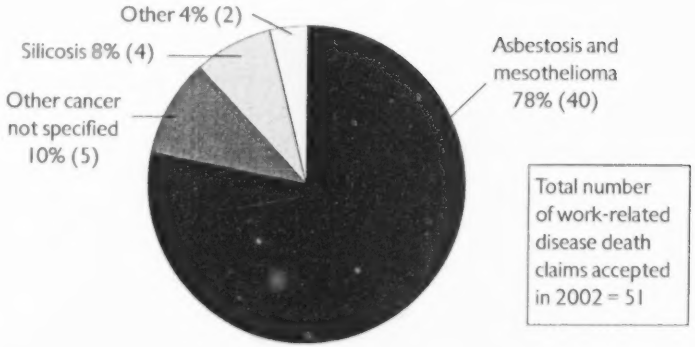
As in previous years, the construction industry, the transportation and related services industry, and the forest industry were the hardest hit by work-related deaths in 2002, with 71 deaths – close to half (45%) of all work-related deaths.

Hazardous substances cause disease deaths

It may be many years after exposure to a hazardous substance such as asbestos before workers are aware they have a health problem. Workers (and their families) may then spend many more years coping with a terminal illness. Work-related disease deaths have a huge cost in terms of human suffering. The WCB is committed to preventing exposure to substances that will result in work-related diseases in the future.

In 2002, the WCB accepted 51 death claims resulting from work-related diseases, down from 58 disease death claims the previous year. The disease categories are shown in the following graph. The sidebar on page 18 describes each category and gives examples of the types of deaths that occurred in 2002.

Work-related disease deaths in B.C., 2002


Other 4% (2)
Silicosis 8% (4)
Other cancer not specified 10% (5)
Asbestosis and mesothelioma 78% (40)
Total number of work-related disease death claims accepted in 2002 = 51

Asbestosis and mesothelioma – diseases caused by exposure to asbestos – account for 78% of the work-related disease deaths in 2002.

Asbestosis and mesothelioma take a long time to develop. Workers exposed to asbestos may not be diagnosed with either disease for 25 to 40 years after being exposed. As a result, deaths from these diseases are expected to continue for several decades, even though there are now safe work practices for handling asbestos and workers are much better protected from the harmful fibres than they were in the past.

Asbestosis is often a slowly progressive disease, meaning that most of the workers who died from it in 2002 had their initial disease claims accepted by the WCB 15 to 25 years earlier. Mesothelioma is usually a rapidly progressive disease, meaning that most of those who died from it in 2002 had their claims accepted six months to two years earlier. As workers reach the end of the 25-to-40-year period after exposure to asbestos, more and more of them are being diagnosed with these diseases.

Workers in many industries can be exposed to asbestos and other hazardous substances that cause disease. However, over half of the 51 disease deaths in 2002 occurred in two industries: construction (15 deaths) and metal and non-metallic products and manufacturing (12 deaths).

Common work-related diseases

Asbestosis and mesothelioma are asbestos-related diseases. Asbestosis is the name given to scarring and stiffening of the lungs caused by inhaling asbestos dust over many years. It makes breathing difficult. It can lead to fatal complications such as pneumonia, heart disease, and lung cancer. Mesothelioma is a rare cancer of the linings of the lungs and abdomen that almost always leads to death. Practically all mesothelioma cases are linked to asbestos exposure. These diseases usually develop decades – 25 to 40 years – after the worker was exposed to asbestos fibres. Workers who develop asbestosis or mesothelioma have usually been exposed to asbestos fibres during processes such as installing, removing, or simply working around asbestos insulation or other asbestos-containing materials.

A sheet-metal worker exposed to asbestos died of asbestosis.

A stenographer exposed to asbestos in a building where renovations had been done died of mesothelioma.

A shipwright exposed to asbestos on board marine vessels died of asbestosis.

Silicosis is a chronic lung disease caused by inhaling silica dust over many years. Like asbestosis, it scars and stiffens the lungs, making breathing difficult. Silicosis can lead to heart failure and death. Workers who develop silicosis have typically been exposed to silica dust in mining operations or other work in which rock is being drilled, crushed, or moved. The most common type of crystalline silica is quartz, a basic component of sand and most rocks.

A miner exposed to silica dust died of silicosis.

A mechanic exposed to silica died of silicosis.

Other work-related diseases include cancers such as leukemia and colon, lung, and brain cancer; infectious diseases such as hepatitis C and bacterial infections; emphysema (a breakdown of lung tissue that reduces lung elasticity and gas exchange); and scleroderma (progressive hardening of the skin and connective tissue, possibly associated with exposure to silica dust).

A truck driver exposed to dust and fumes containing crystalline silica died of scleroderma.

An assayer who had been exposed to a variety of airborne carcinogens died of colon cancer.

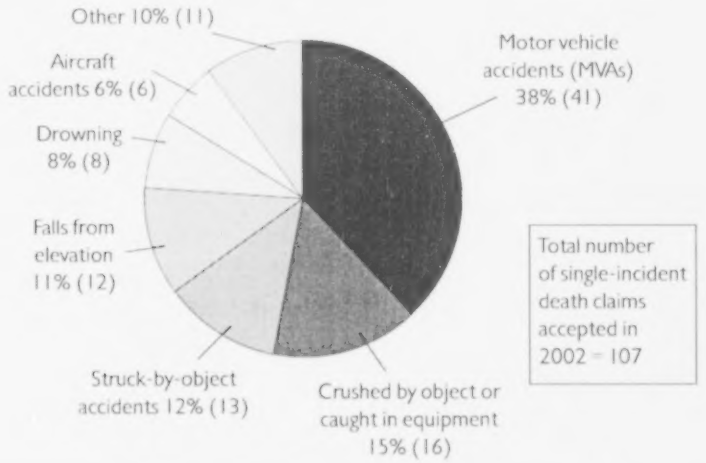
A truck driver who had been exposed to benzene while delivering gasoline died of leukemia.

Single-incident deaths

Work-related accidents killed 107 workers in B.C. in 2002. Any number of accidents causing death is too many because almost all single-incident deaths are preventable. For this reason, the WCB continues to focus much of its prevention efforts on educating employers and workers about ways to identify and eliminate workplace hazards.

In the following graph, single-incident deaths are divided into accident categories. The sidebar gives definitions for each accident category along with examples of the types of accidents that occurred in 2002.

Single-incident deaths in B.C., 2002


Other 10% (11)
Motor vehicle accidents (MVAs) 38% (41)
Aircraft accidents 6% (6)
Drowning 8% (8)
Falls from elevation 11% (12)
Struck-by-object accidents 12% (13)
Crushed by object or caught in equipment 15% (16)
Total number of single-incident death claims accepted in 2002 = 107

Echoing previous years, 41 workers died in motor vehicle accidents (MVAs), accounting for 38% of all single-incident deaths in B.C. Eighteen of these workers were truck drivers. Sixteen of them were in the transportation and related services industry, accounting for 62% of fatalities in that industry.

Common accident types

Motor vehicle accidents (MVAs) are accidents involving one or more licensed vehicles and often involving pedestrians as well. Workers may be driving their own cars or trucks, or they may be driving company vehicles such as cars, pickup trucks, delivery vans, or logging trucks.

A truck driver was killed when his chip truck ran off an icy road.

A taxi driver was killed in a head-on collision with another vehicle.

A truck driver was killed when his truck went over an embankment.

Struck-by-object accidents are accidents in which a worker is struck by a moving object such as a falling tree, a rolling log, an unstable load that shifts, a piece of machinery that flies off, or an improperly parked vehicle that rolls.

A faller was struck and killed by a falling tree.

An oilfield worker was struck and killed by a two-ton pipe.

A labourer died after being struck and pinned by a beam while working under a house.

Drowning accidents are accidents in which a worker drowns. For example, workers can drown when a boat sinks or capsizes, or while trying to save a co-worker, or as a result of falling overboard.

A fisherman drowned after the boat capsized.

A deckhand was presumed drowned after a fishing boat sank.

A heli-logger fell into a mountain stream and drowned.

Crushed-by-object or caught-in-equipment accidents are accidents in which a worker is caught or crushed in a piece of equipment or crushed between two objects.

A boulder crushed a faller against a previously felled tree.

A mill worker was crushed between a dump gate and a steel structural wall on a conveyor system.

A truck driver was crushed under the wheels of a logging truck.

continued

Aircraft accidents are accidents in which an airplane, a helicopter, or another type of aircraft crashes because of mechanical failure, bad weather, poor visibility, or some other cause. Workers may be piloting aircraft for heli-logging, heli-skiing, or sportfishing operations, in the charter air service industry, or while flying workers in and out of remote work sites.

A pilot was killed in a helicopter crash.

A helicopter instructor was killed in a crash while on a training flight.

Falls from elevation are accidents in which a worker falls from a height and lands on a surface below the one on which the worker stood before the fall. Workers fall from roof edges, through holes in roofs or floors, while walking along open beams, and from ladders or sets of stairs.

A construction worker died after going through a plywood sheet and falling 16 storeys.

A carpenter died after falling 8 m (27 feet) through a skylight opening onto a concrete slab.

A foam cutter died after falling approximately 3 m (10 feet) from the top of a foam pile.

Other accidents include accidents involving motorized equipment (industrial vehicles), electrical contact, exposure to toxic substances, and acts of violence or force.

A government technician was shot and killed by a co-worker.

A truck driver was killed after his boom truck came into contact with an overhead power line.

A worker in the fishing industry died from carbon monoxide exposure when the wind blew exhaust fumes back into the boat.

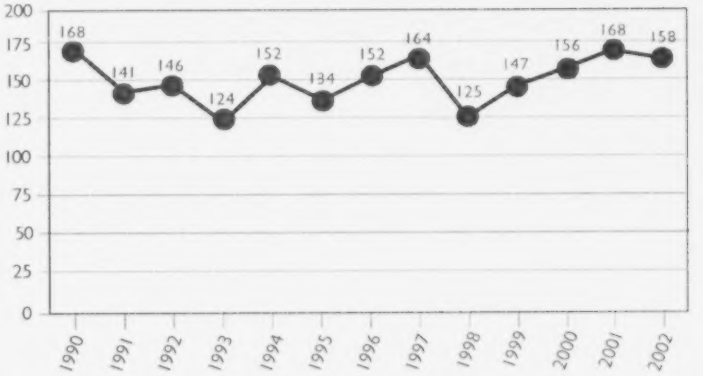
How 2002 statistics relate to previous years

This section explains how the 2002 statistics on work-related deaths in B.C. compare with statistics from recent years. It examines trends in the number of deaths in B.C. workplaces, death rates, and the proportion of single-incident deaths to work-related disease deaths.

Number of deaths remains stable

Awareness of health and safety in B.C. workplaces has led to better training, safer work practices, and improvements in equipment and facilities, yet the total number of work-related deaths per year has changed little over the past 13 years. However, the *number of deaths* tells only part of the story.

Total number of death claims accepted, 1990–2002

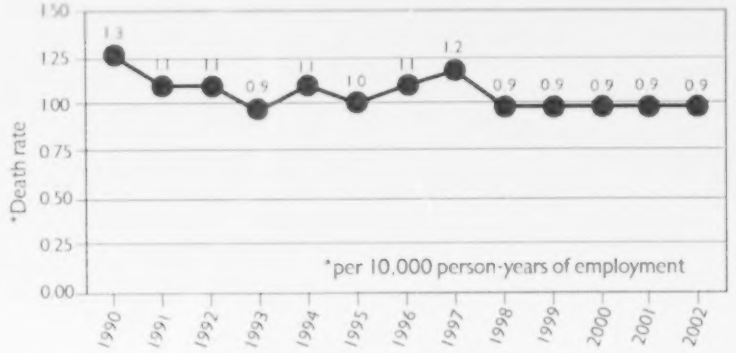


The total number of work-related death claims accepted by the WCB each year has changed little from 1990 to 2002, averaging almost 149 deaths per year.

Death rates have dropped

To get a more accurate idea of how safe B.C. workplaces are, one must look at *death rates*, which reflect the number of work-related deaths in relation to the number of workers employed during that year. The following graph shows how the death rate has declined from 1990 to 2002. Each number in this graph indicates the number of deaths that occurred for every 10,000 person-years of employment. For example, the death rate of 0.9 in 2002 means that for every 10,000 people working full-time during that year, 0.9 people died from a work-related accident or disease.

Death rate, 1990–2002



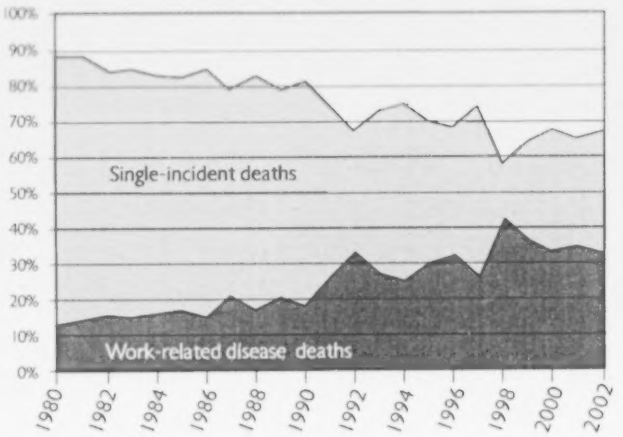
The death rate has declined from 1.3 in 1990 to 0.9 for the past five years.

Work-related disease deaths remain high

Work-related disease deaths have been increasing over the past 23 years while single-incident deaths have been decreasing. Disease deaths account for a growing proportion of overall work-related deaths, from 13% in 1980 to 32% in 2002. This explains why the overall number of deaths each year stays about the same, even though health and safety improvements have reduced the number of single-incident deaths.

Most of the disease deaths in recent years have been from asbestosis and mesothelioma, which are usually diagnosed 25 to 40 years after a worker was exposed to asbestos fibres. Many workers are reaching the end of the 25-to-40-year period and are now being diagnosed with these diseases. Because workers generally survive for 15 to 25 years after being diagnosed with asbestosis (see page 18), deaths from this disease are expected to continue for several more decades.

Proportion of single-incident deaths to work-related disease deaths in B.C., 1980–2002



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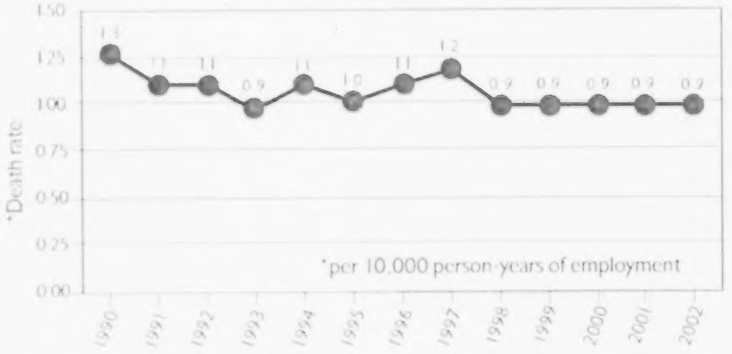

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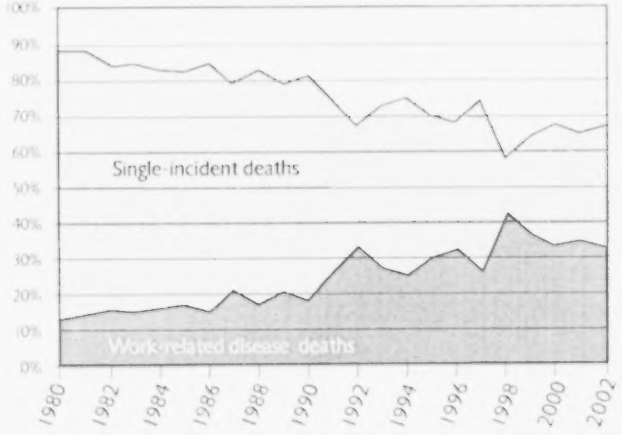

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Preventing work-related deaths

The WCB believes that almost all work-related deaths can be prevented. We are committed to eliminating work-related deaths by resolving the health and safety issues in B.C. workplaces today.

This section reviews the ways the WCB works to prevent work-related deaths and what the WCB does when a work-related death occurs.

The WCB works to prevent work-related deaths by:

- Inspecting workplaces and enforcing regulations
- Educating and consulting with employers and workers

When a work-related death occurs, the WCB provides:

- Accident investigation
- Compensation for surviving dependants
- Emotional support for family and co-workers

Inspection and enforcement

The WCB believes that one of the best ways to prevent work-related deaths is to go to the root of the problem. To this end, WCB officers inspect workplaces around B.C. – identifying hazards that can cause injury or death, then finding ways to improve or eliminate hazardous conditions. Officers inspect workplaces to ensure they are meeting the minimum requirements outlined in the Occupational Health and Safety Regulation, and the *Workers Compensation Act*.

The Occupational Health and Safety Regulation is essentially a written agreement stating the types of risks that are unacceptable to us as a society. It sets requirements for employers and workers regarding hazard assessment, equipment maintenance and inspection, worker training, worker use of protective equipment, control of hazardous substances, and emergency procedures.

The *Workers Compensation Act* describes the WCB's jurisdiction and its authority to make regulations, inspect workplaces, issue orders, and impose penalties. The *Act* also explains the rights and responsibilities of employers and workers with respect to health and safety.

Education and consultation

The WCB knows that education and consultation can prevent work-related deaths. By consulting with employers and workers, the WCB can learn more about current and potential issues in today's workplaces. With this knowledge, WCB officers can help educate employers and workers about problem areas, and work with them to develop solutions.

Officers are available to explain B.C.'s safety requirements and to help employers and workers understand how they can comply with these requirements. Officers will also make presentations to employers and workers on specific health and safety issues, such as properly identifying hazardous materials or the importance of locking out equipment before performing maintenance on it.

A wide range of safety information and services are available on the WCB's Health and Safety Centre Web site (www.healthandsafetycentre.org), a part of WorkSafe online (www.worksafebc.bc.ca).

Working with industry to make changes for a safer workplace

The continued commitment of employers, supervisors, workers, and the WCB to improve health and safety in the workplace will reduce injuries and disease – and save lives. To this end, the WCB works jointly with various industry groups to identify safety solutions that reflect the unique work environments of each industry.

Forestry: An example of a joint approach

Four forestry initiatives currently underway have been developed through strategic partnerships between the WCB and industry associations, employers, and labour.

- **FallSafe** – A seminar for fallers, supervisors, and other forest industry workers has been developed by WCB occupational safety officers and the Industrial, Wood, and Allied Workers of Canada.
- **Faller Supervisor Program** – This pilot program brings together the Council of Forest Industries (COFI), IWA–Canada, the WCB, and a number of forest companies from the Interior and Coastal forest regions. Called "Stop, Check and Correct," the program includes frequent work site inspections with on-site instruction and correction by supervisors to reinforce the use of safe falling practices.
- **Faller Training and Certification** – Representatives from COFI, IWA–Canada, the Interior logging associations, and the WCB are updating this 1991 faller/bucker training program.
- **Innovative Falling Practices** – Five processes that have the potential to increase falling safety are being evaluated by a team of engineers, occupational safety officers, fallers, and managers from Weyerhaeuser and the WCB.

Joachim Graber, manager of training and development for the Forest Industry Safety Association, says that making changes requires a multi-faceted response, including implementing changes at a supervisory level, educating workers, changing to safer tools and processes, and enforcing safety regulations. "Safety is sometimes sacrificed for productivity, so a change in culture is partly what is needed, as well as a better system to provide economic stability for the workers within safe working condtions."

Ron Corbeil, national health and safety director for IWA–Canada, agrees that the forest industry needs to change the way it deals with health and safety in the workplace. "Learning good safety habits from the start is vital, but it's only part of the solution. We need to reinforce safe work habits continually and lead by example. In difficult times health and safety must remain a priority. No one will remember in a month's time that you saved two minutes by taking a shortcut, but they will remember if that shortcut ended up costing you your life."

Accident investigation

Education can be a powerful tool, and the WCB recognizes the need to keep learning, even in the face of tragedy. When a workplace accident does occur, the WCB tries to learn as much as possible about what went wrong so that it can help prevent similar accidents in the future.

During an accident investigation, WCB officers talk to workers and supervisors about what happened and look over the scene of the accident to determine the elements that may have contributed to the accident. Accident investigation provides the WCB and the employer with important information about accident causes and points toward ways in which the WCB and the employer can better educate workers about health and safety in the workplace.

Compensation

If a worker dies from a work-related injury or disease, the WCB is committed to providing meaningful, fair compensation to that workers' dependants (usually the spouse and children), to ensure that they are taken care of in the short term and the long term. If the worker has a work-related disease or injury before death, the WCB may also pay health-care costs.

Emotional support

Compensation costs are one aspect of support that the WCB provides for families, but the WCB is equally concerned about the mental and emotional well-being of survivors. If a family needs help, the WCB will arrange for counselling to help them work through the issues that arise following the loss of a loved one.

The WCB recognizes that a worker's death can affect many people besides the worker's family. Through the Critical Incident Response (CIR) program, the WCB provides post-accident intervention and support for the co-workers of someone who dies on the job. Having a co-worker die on the job can be very traumatic, particularly if you witness the death. The CIR program provides workers with tools that can help them deal with the after-effects of a workplace death.

A WCB resource for families coping with a work-related death or terminal illness

Lessons to be learned

All work-related deaths offer us lessons. If we can learn these lessons and work together – employers, supervisors, workers, and the WCB – we can make our workplaces free of hazards that cause injury and disease.